

WE CLAIM:

1. A conjugate consisting essentially of one or more antibody fragments covalently attached to one or more nonproteinaceous polymer molecules, wherein the apparent size of the conjugate is at least about 500 kD.

10 2. The conjugate of claim 1, wherein the apparent size of the conjugate is at least about 800 kD.

15 3. The conjugate of claim 1, wherein the apparent size of the conjugate is at least about 1,400 kD.

4. The conjugate of claim 1, wherein the apparent size of the conjugate is at least about 1,800 kD.

20 5. The conjugate of claim 1, wherein the apparent size of the conjugate is at least about 8 fold greater than the apparent size of at least one antibody fragment.

6. The conjugate of claim 5, wherein the apparent size of the conjugate is at least about 15 fold greater than the apparent size of at least one antibody fragment.

25 7. The conjugate of claim 6, wherein the apparent size of the conjugate is at least about 25 fold greater than the apparent size of at least one antibody fragment.

8. The conjugate of claim 1, wherein the conjugate contains no more than one antibody fragment, and wherein the antibody fragment is selected from the group consisting of Fab, Fab', Fab'-SH, Fv, scFv and F(ab')₂.

9. The conjugate of claim 8 wherein the antibody fragment is $F(ab')_2$.

10. The conjugate of claim 1 wherein at least one antibody fragment is covalently attached to no more than about 10 nonproteinaceous polymer molecules.

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11. The conjugate of claim 10 wherein the antibody fragment is covalently attached to no more than about 5 nonproteinaceous polymer molecules.

12. The conjugate of claim 11 wherein the antibody fragment is covalently attached to no more than about 2 nonproteinaceous polymer molecules.

10 13. The conjugate of claim 12 wherein the antibody fragment is attached to no more than 1 nonproteinaceous polymer molecule.

15 14. The conjugate of claim 12, wherein the antibody fragment comprises a heavy chain and a light chain derived from a parental antibody, wherein in the parental antibody the heavy and light chains are covalently linked by a disulfide bond between a cysteine residue in the light chain and a cysteine residue in the heavy chain, wherein in the antibody fragment the cysteine residue in the light or heavy chain is substituted with another amino acid and the cysteine residue in the opposite chain is covalently linked to a nonproteinaceous polymer molecule.

20 25 15. The conjugate of claim 8 wherein the antibody fragment is selected from the group consisting of Fab, Fab' and Fab'-SH.

16. The conjugate of claim 15 wherein the antibody fragment is covalently attached to no more than 1 nonproteinaceous polymer molecule.

17. The conjugate of claim 16 wherein the nonproteinaceous polymer molecule in the conjugate is covalently attached to the hinge region of the antibody fragment.

18. The conjugate of claim 1 wherein at least one nonproteinaceous polymer is a polyethylene glycol (PEG).

19. The conjugate of claim 18 wherein the PEG has an average molecular weight of at least about 20 kD.

20. The conjugate of claim 19 wherein the PEG has an average molecular weight of at least about 40 kD.

21. The conjugate of claim 19 wherein the PEG is a single chain molecule.

22. The conjugate of claim 20 wherein the PEG is a branched chain molecule.

23. The conjugate of claim 19, wherein the conjugate contains no more than one antibody fragment, and wherein the antibody fragment is a $F(ab')_2$ and is covalently attached to no more than about 2 PEG molecules.

24. The conjugate of claim 19, wherein the conjugate contains no more than one antibody fragment, and wherein the antibody fragment is selected from the group consisting of Fab, Fab' and Fab'-SH and is covalently attached to no more than one PEG molecule.

25. The conjugate of claim 24 wherein the PEG molecule is covalently attached to the hinge region of the antibody fragment.

26. The conjugate of claim 1 wherein at least one antibody fragment comprises an antigen binding site that binds to human interleukin-8 (IL-8).

27. The conjugate of claim 26, wherein the conjugate contains no more than one antibody fragment, wherein the antibody fragment is selected from the group consisting of Fab, Fab' and Fab'-SH, wherein the antibody fragment is covalently attached to no more than one nonproteinaceous polymer molecule, and wherein the nonproteinaceous polymer molecule is a polyethylene glycol having an average molecular weight of at least about 30 kD.

10 28. The conjugate of claim 26 wherein the antibody fragment comprising the anti-human IL-8 antigen binding site is humanized.

15 29. The conjugate of claim 28 wherein the anti-human IL-8 antigen binding site comprises the complementarity determining regions of a light chain polypeptide amino acid sequence selected from the group consisting of the 6G4V11N35A light chain polypeptide amino acid sequence of Fig. 36 (SEQ ID NO:56) and the 6G4V11N35E light chain polypeptide amino acid sequence of Fig. 45 (SEQ ID NO:62).

20 30. The conjugate of claim 29 wherein the conjugate contains no more than one antibody fragment.

31. A composition comprising the conjugate of claim 1 and a carrier.

32. The composition of claim 31 that is sterile.

25 33. The conjugate of claim 1, wherein the covalent structure of the conjugate is free of any matter other than the antibody fragment and nonproteinaceous polymer molecules that form the conjugate.

34. The conjugate of claim 1, wherein the covalent structure of the conjugate incorporates one or more nonproteinaceous labels, and wherein the covalent structure of the conjugate is free of any matter other than the antibody fragment, nonproteinaceous polymer and nonproteinaceous label molecules that form the conjugate.

35. The conjugate of claim 34 wherein at least one nonproteinaceous label is a radiolabel.

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